tdc environmental

MEMO

TO: Dioxins Project Participants **DATE:** June 3, 2002

FROM: Kelly D. Moran **PROJECT:** 23

SUBJECT: Funding for Municipal Diesel Vehicle Fuel Conversion or Replacement with Alternative Fuel Vehicles

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Municipalities participating in the Bay Area Dioxins Project have expressed significant interest in replacing their municipality's diesel vehicles with less polluting alternatives. Although all of the municipalities participating in the dioxins project have initiated changes within their fleets (see attached case studies for examples), the municipalities have identified funding for replacing diesel vehicles and/or installing fueling infrastructure as one of the major barriers to more rapid change in fleet composition. To address this barrier, the Bay Area Dioxins Project asked TDC Environmental to investigate funding options that are available to assist municipalities with converting or replacing diesel vehicles with natural gas, biodiesel, or other less-polluting vehicle technologies.

Summary

TDC Environmental surveyed government agencies and other entities to identify funding opportunities for diesel vehicle alternatives for municipal fleet vehicles.[1] Table 1 (attached) summarizes the key facts about the identified funding opportunities. The funding sources that are most promising to address the goals of the Bay Area Dioxins Project municipalities are the Transportation Fund for Clean Air and the Carl Moyer Program (both administered by the Bay Area Air Quality Management District), and the Department of Energy Clean Cities Program, administered by local Clean Cities Coalitions in the East Bay, South Bay, and San Francisco. Table 2 (on the next page) gives a quick overview of the types of projects that are appropriate for each of the most promising funding sources.

Because only one of the Bay Area Dioxins Project municipalities owns buses, funding for buses was not the focus of the survey. During the survey, several special funding sources available to operators of public transportation buses or school buses were noted; these are briefly described in Table 3 (attached).

All of the identified funding sources are grant programs—no other types of funding were found. While tax incentives exist for certain vehicle conversions, such incentives are not applicable to municipalities.

[1] The survey included the U.S. Environmental Protection Agency, U.S. Department of Energy, Federal Aviation Administration, Federal Highway Administration, National Renewable Energy Laboratory, California Energy Commission, California Air Resources Board, Bay Area Air Quality Management District, Metropolitan Transportation Commission, several county transportation agencies, organizations promoting diesel vehicle conversion, and organizations of or for fleet managers. Most information was obtained from the Internet sites of the surveyed organizations.

Table 2. Projects Eligible for Most Promising Grant Programs

Grant Programs	Projects Eligible for Funding					
	Diesel retrofits	Replace-ment vehicles*	New vehicles	Heavy duty	Light duty	Fueling facilities
Transportation Fund for Clean Air						
Regional Fund		X		X		
Vehicle Incentive Programs		X	X		X	
County Program Manager Funds		X	X	X	X	X
Carl Moyer Program						
Heavy-Duty Vehicle Program	X	X		X		
Infrastructure Program						X
Clean Cities-Related Grants	X	X	X	X	X	X

*Vehicles replacing a similar or equivalent vehicle in the same fleet.

Descriptions of several projects to convert or replace diesel vehicles with CNG, biodiesel, or other less-polluting vehicle technologies are attached in Appendix A. Although this is not a comprehensive set of case studies, it provides examples of the types of changes that are being made by municipalities to address air pollution from diesel vehicles.

1.0 Transportation Fund for Clean Air (TFCA)

In 1991, state law was changed to authorize the Bay Area Air Quality Management District (BAAQMD) to increase vehicle registration fees by up to $4.00 per vehicle to implement transportation-related measures to reduce air pollution. The TFCA seeks to fund cost-effective transportation projects and programs to reduce motor vehicle travel and vehicle emissions. Only public agencies are eligible for TFCA funding; however, public agencies can receive funds on behalf of a non-public entity that provides essential services (like a garbage hauler or a taxi company), if the public agency has a contractual or strong regulatory relationship with the non-public entity.[2]

Sixty percent of the funds from the $4 fee are administered by the BAAQMD; forty percent of these funds are distributed to each county based on a proportional share of paid vehicle registrations. The BAAQMD uses the TFCA funds to support its own activities to reduce transportation-related air pollution and to fund several grant programs that give municipalities funding to support actions that reduce air pollution. Two of these grant programs are potential sources of funds for municipalities seeking to purchase alternative fuel vehicles to replace diesel vehicles. The county portion of the funds, which are known as the "TFCA County Program Manager Funds," are allocated and administered

[2] A simple fee-based regulatory relationship (*e.g.*, a business license) would not be sufficient, but a permit with specific compliance requirements (*e.g.*, a taxi permit) is sufficient.

by a program manager selected within each county. Each of the three applicable grant programs funded by TFCA is described below.

1.1 TFCA Regional Fund

The TFCA Regional Fund subsidizes the cost of clean fuel vehicles with a gross vehicle weight (GVW) greater than 10,000 lbs.[3] The grant program has several important criteria:

- Only replacement vehicles. Grant applicants must replace an existing similar or equivalent vehicle in the same fleet. The vehicle being replaced must be destroyed[4]—a new requirement in 2002. Engine retrofits are not eligible.
- Only incremental cost can be funded. Applicants may receive no more than the incremental cost of the cleaner vehicle. Incremental cost is the difference in the purchase prices of the clean air vehicle and its diesel or gasoline counterpart.
- Only certain vehicles eligible. All engine-certified vehicles (some medium duty and all heavy duty vehicles) must be certified to the California Air Resources Board's (CARB's) optional low-nitrogen oxides (NO_x) standards, or deemed by CARB as eligible under the Carl Moyer Program.[5] All engine certified hybrid electric vehicles (HEVs) must demonstrate NO_x emissions of no more than 2.0 grams per brake horsepower hour to be eligible for TFCA funding, regardless of the fuel used in the hybrid electric configuration.
- Alternative fuel vehicles only. With the exception of certain hybrid electric vehicles, no vehicles with the ability to run on gasoline or diesel fuel as their primary fuel will be funded.

The TFCA Regional Fund is probably the best source of grant funding for San Francisco Bay Area municipal diesel vehicle replacements. Some dioxins project municipalities have previously received grants for diesel vehicles from the TFCA Regional Fund (see Table 4, attached). The new vehicle destruction requirement could be a barrier for municipality use of these grant funds, as it prevents use of this grant for additions to a fleet and precludes vehicle resale (some diesel vehicles being removed from service have meaningful resale values).

1.2 Basic and High-Mileage Vehicle Incentive Program (VIP)

The VIP helps public agencies acquire low emission, alternative fuel vehicles (natural gas, propane, electric, and hybrid-electric) with a gross vehicle weight of 10,000 pounds or less. While most vehicles in this weight class are not diesel-fueled, some municipal fleets have purchased diesel pickup trucks and vans that could be replaced with alternative fuel vehicles. This discussion focuses on funding for potential diesel vehicle replacements.

[3] This is the only regional program that can subsidize vehicles between 10,000 and 14,000 pounds GVW.
[4] For example, destruction of the engine block and frame/chassis.
[5] A list of certified engines is available at http://arbis.arb.ca.gov/msprog/moyer/certs.htm

In the regular VIP, incentives are awarded on a first-come, first served basis until the available funds are exhausted. Each municipality may receive up to $100,000 of VIP funds annually. Like the TFCA Regional Fund, this grant program has several specific criteria:

- Only certain vehicles eligible. Vehicles must be certified to the ultra low emission vehicle (ULEV), super ultra low emission vehicle (SULEV), or zero emission vehicle (ZEV) standard by the California Air Resources Board. A variety of pickup trucks and vans meet these standards.[6]
- Flat amount of funds per vehicle. For 2001/02, incentives for diesel replacements were: SULEV Natural Gas or Propane—$4,500 per vehicle, ZEV freeway electric vehicle—$6,000 per vehicle.
- Alternative fuel vehicles only. (Same as Regional Fund).
- Cannot combine with certain other grants. Agencies purchasing ZEVs that have received a CARB incentive (up to $9,000 per vehicle) for a vehicle cannot also receive VIP funds for the same vehicle. Any vehicle for which purchasing assistance comes from TFCA County Program Manager grant funds is ineligible for a VIP grant.

The VIP can be used for either new or replacement vehicles. There is no requirement for scrapping vehicles that are replaced.

Applications are still being accepted for last year's (2001/02) VIP. Funds can be provided for already planned purchases of eligible vehicles. The application is on the Internet at www.baaqmd.gov/planning/plntrns/vip.htm. For questions, contact Dave Burch, BAAQMD 415-749-4641.

The related high-mileage VIP (HMVIP) provides incentives for vehicles that will be driven 60,000 miles per year or more. Since municipal vehicles rarely have such high mileage, these grants are typically awarded to municipalities to support alternative fuel vehicle purchases by private operators of taxis and shuttle buses.[7] Grants issued under the HMVIP can total up to $100,000 per municipality per year.[8]

1.3 County Program Manager Grant Programs

County administering agencies manage the Transportation Fund for Clean Air (TFCA) County program manager grant funds.[9] The County administering agencies for Bay Area counties are:

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[6] In 2001/02, examples of eligible vehicles included: Ford F-150 Pick-up CNG, Ford E-250 Van CNG, Ford E-350 Van CNG, Chrysler Ram Van 2500 CNG, Chrysler Ram Van 3500 CNG, Chrysler Ram Wagon 2500 CNG, Chrysler Ram Wagon 3500 CNG, Honda Civic GX CNG, Toyota RAV4 EV, and Ford Electric Ranger pick-up EV. New vehicles are likely to join the list of vehicles previously eligible for funding.

[7] Under the provision that municipalities can receive funds on behalf of a non-public entity that provides essential services, if they have a contractual or strong regulatory relationship with the non-public entity.

[8] The funding caps for the VIP and HMVIP are separate, so a municipality can receive up to a total of $200,000.

[9] While BAAQMD has final approval of the TFCA funds, the regional agency approvals are relatively routine, based primarily on compliance with applicable program requirements.

- Alameda County Congestion Management Agency (CMA)
- Contra Costa Transportation Authority
- Marin County Congestion Management Agency (CMA)
- Napa County Transportation Planning Agency
- San Francisco County Transportation Authority
- San Mateo City/County Association of Governments (C/CAG)
- Santa Clara Valley Transportation Authority (VTA)
- Solano Transportation Authority
- Sonoma County Transportation Authority

Most of the above agencies have boards that are comprised of City Council and County Board of Supervisors members. This arrangement gives municipalities a direct connection to the project selection process. Records for TFCA County Program Manager grants show that most of the dioxins project participating jurisdictions are already using these funds for City projects (see Table 5, attached). Using this funding source for diesel vehicle conversion would likely involve prioritization of diesel vehicle conversions with other eligible municipal projects.

2.0 Carl Moyer Program

The Carl Moyer Program was established by the California legislature to fund the extra capital cost of cleaner than required heavy-duty vehicles and equipment typically operated with diesel fuel in order to provide air quality benefits. Most of the program's funding depends on annual appropriations from the legislature.[10] Within the Carl Moyer program, there are several specific grant programs, two of which could provide funding for municipal diesel vehicle conversions and related alternative fuel infrastructure. These two programs are described below.

2.1 Regional Heavy-Duty Vehicle Program

The Carl Moyer grant program is specifically designed to fund retrofitting or replacement of diesel engines. Funds can assist with the purchase of a new low emission diesel vehicle, replacement of an older diesel engine with a newer one that exhibits lower emissions (repower), or retrofitting an existing diesel engine to result in lower emissions. (Note that this grant program is unique in funding diesel vehicle retrofits.) Both public agencies and private companies are eligible. The BAAQMD, which supplements state funding for this program, administers this grant program for the Bay Area.

- Only certain vehicles eligible. All engine-certified vehicles (some medium duty and all heavy duty vehicles) must be certified to CARB's optional low-NO_x standards, or deemed by CARB as eligible under the Carl Moyer Program.[11]
- Many types of diesel engines are eligible. Engines that municipalities may own that are eligible for Carl Moyer program funding include engines in on-road vehicles, off-road vehicles, locomotives, airport ground support equipment,

[10] Which may not happen in lean budget years like 2002/03.
[11] A list of certified engines is available at http://arbis.arb.ca.gov/msprog/moyer/certs.htm

stationary engines, and forklifts. Only vehicles over 14,000 pounds gross vehicle weight are eligible.

- Practical limitation on grant size. The BAAQMD uses a strict cost-effectiveness evaluation of applications, based on dollars per ton of annual nitrogen oxide (NO_x) emissions eliminated. Successful projects have requested $2,000 per ton or less. According to the BAAQMD, the primary reason that municipalities have not received funding from this program is that they have asked for more than $2,000 per ton of NO_x emissions eliminated.
- Best for retrofit or replacement of older engines. Retrofitting or replacing older engines (especially pre-1987 engines) provides the biggest NO_x reductions. For such engines, the cost-effectiveness rating will be better, making it more likely that the grant can provide a meaningful part of the project funding.[12]

New environmental justice criterion. A recent change to the Carl Moyer Program requirements may help some dioxins project municipalities obtain funds. While the BAAQMD has not historically funded municipality fleet vehicle replacements with this program (in contrast to other air districts), in the future the BAAQMD will have to change its operations to meet a new legislative mandate that 50% of the Carl Moyer program funds be spent to reduce emissions from diesel vehicles that occur in those areas with the most significant exposure to air contaminants. The specific requirements of the new mandate are to spend Carl Moyer funds so that the grant:

> "[D]irectly reduces air contaminants or reduces the public health risks associated with air contaminants...including, but not limited to, airborne toxics and particulate matter, in communities with the most significant exposure to air contaminants or localized air contaminants, or both, including, but not limited to, communities of minority populations or low-income populations...."

This new mandate will favor replacement of diesel engines that are used primarily in economically disadvantaged areas with many other air pollution sources (see BAAQMD's list of such areas, in Appendix B). The intent of the mandate was to force funds to be used in neighborhoods with environmental justice concerns.

2.2 California Energy Commission Heavy-Duty Alternative Fuels Infrastructure Program

Carl Moyer Heavy-Duty Alternative Fuels Infrastructure Program grants to are intended to support public and private installation of alternative fuel dispensing facilities. The grants are awarded to public and private entities by the California Energy Commission (CEC) through the BAAQMD and other local air districts.

- Storage and dispensing equipment only. Funds may not be used for purchasing any other related items.

[12] The California Air Resources Board recognized in its March 2002 Annual Report on the Carl Moyer Program that the strict cost-effectiveness evaluation method penalizes proactive fleets that have been upgrading vehicles all along, but has not made any proposal to modify the grant program to address this.

- Only certain fuels eligible. Eligible fuels are all non-petroleum-based fuels including, but not limited to, natural gas, liquefied petroleum gas, and alcohol fuels.[13]
- Funding limits. Funding per project cannot exceed 50% of the total project cost, nor can it exceed $100,000 for new facilities or $30,000 to refurbish or expand the fueling capability of existing facilities.
- Minimum usage requirement. All infrastructure locations shall dispense a minimum of 14,280 million BTUs annually over the five-year period following installation.

The minimum usage requirement has apparently been a significant barrier to use of this grant funding by municipalities, which must convert a relatively large number of vehicles to the alternative fuel to use the required quantity of fuel.[14]

3.0 Clean Cities Program

Clean Cities is not itself a grant program, but it is directly linked to a U.S. Department of Energy (DOE) grant program called the "Clean Cities State Energy Program." In California, the California Energy Commission administers the DOE Clean Cities grants available to municipalities. The Clean Cities grant program can provide funds to municipalities that are members of Clean Cities Coalitions to support installation of fueling infrastructure and to purchase "niche market alternative fuel vehicles" like local government fleet and airport vehicles. Grant applications need to be made to the California Energy Commission through a Clean Cities Coalition. Three existing Clean Cities Coalitions and one soon to be designated Clean Cities Coalition represent all of the San Francisco Bay Area, which means that simply affiliating with and participating in an existing Clean Cities Coalition can make most Bay Area municipalities eligible for this grant funding.

- Grants available for most municipal diesel vehicle conversion projects. Both fueling infrastructure projects and purchase of replacements for most fleet vehicles are eligible. "Niche market alternative fuel vehicles" include (but are not limited to) local government fleets of refuse haulers, motor pools, and support operations vehicles; airport shuttle buses and vans; taxi fleets; and cargo delivery vehicles.
- Only designated Clean Cities coalitions are eligible for funding. Participating in the Clean Cities coalition is a pre-condition for all grant recipients. Coordinators for the four Bay Area Clean Cities coalitions are listed below.
    - East Bay Clean Cities Coalition—Chris Ferrara, (925) 674-6533, caf3@pge.com
    - San Francisco Clean Cities Coalition—Rick Ruvolo, (415) 554-6184, Rick_Ruvolo@ci.sf.ca.us

[13] Both the CEC and BAAQMD have other funding sources for electric vehicle charging stations.
[14] California Air Resources Board, *Carl Moyer Program Annual Status Report*, March 26, 2002.

  - South Bay Clean Cities Coalition—Mary Tucker, (408) 277-4111, mary.tucker@ci.sj.ca.us (coalition includes San Mateo County)
  - Redwood Empire Clean Cities Coalition (includes all North Bay Counties up to the Oregon border; awaiting final formal approval by DOE)—Chuck Hammond, (707) 543-3903, chammond@ci.santa-rosa.ca.us

- Significant cost share requirement. 33 to 50% of project funds must be municipality matching funds. However, when a project is considered as a whole, this match requirement may actually allow more grant funds per vehicle purchased and higher funding for fueling infrastructure installation than other grant programs.

In addition to the Clean Cities State Energy Program, DOE offers Clean Cities Coalitions the opportunity to apply for grants that DOE issues annually based on DOE's specific needs each year. These grant opportunities are called "Broad Area Announcements" (BAAs). While this year's BAAs did not include funds for municipal diesel vehicle projects, past grant solicitations have included funds that could be used for such projects.

Although it is not a stated funding criterion, this type of grant program typically awards the most funds to municipalities that are active in the related program. "Silent" Clean Cities Coalition members should not expect to receive large grants unless they make real commitments to the Clean Cities Program.

4.0 Discussion and Recommendations for Bay Area Municipalities

Funding for replacing, retrofitting, and repowering diesel vehicles and/or installing fueling infrastructure is clearly one of the major barriers to more rapid change in municipal fleet diesel engine air pollutant emissions. Bay Area Dioxins Project municipalities are not alone in facing this problem. The grant programs described in this memorandum were established with the specific purpose of providing funding assistance to municipalities and others to remove this barrier to reducing air pollutant emissions. Together, the available grant programs can provide funding for some, but not all, diesel vehicle alternatives projects. While these grant programs do not meet every municipal need, they offer significant opportunities to municipalities.

The California Air Resources Board (CARB) has promoted diesel vehicle alternatives to fleets, using grant programs as a way to motivate changes. Recently, CARB recognized that existing grant programs have not made anticipated changes in fleet use of diesel vehicles.[15] Several factors have played into this problem: (1) cost sharing of fueling infrastructure projects by itself has not been enough to convince fleets to purchase alternative fueled vehicles; (2) some clean fueled fleet vehicles eligible for grant funding (*e.g.*, refuse vehicles) have relatively high incremental cost; (3) grant requirements (*e.g.*, minimum fuel use, engine destruction) create significant new costs that may outweigh the benefits of a grant; and (4) strict cost-effectiveness rating systems for heavy-duty engine programs (*e.g.*, the Carl Moyer Program) disfavor fleets that are leaders on air quality—who are the most likely entities to stimulate broader change in the fleet community.

[15] *Ibid*.

CARB's identification of these barriers may result in future California grant program design changes that may make grant programs more favorable for fleets.

Despite the limitations of existing grant programs, there are ways that municipalities can maximize their opportunities to obtain grant funds to reduce emissions of dioxins and other air pollutants from diesel vehicles in municipal fleets:

1. Monitor the grant programs described in this memorandum. E-mail or call the contact person and ask to be notified with the Request for Proposals (RFP) is released. Check the listed Internet site around the time listed in Table 1 for release of the RFP.
2. Evaluate opportunities when the RFP comes out. Review the RFP carefully, talk with the grant contact, and look at your own fleet purchasing plans (vehicles already programmed for purchase may be subsidized by grants). Determine if it is possible to structure a grant application that is likely to be successful and that would provide a useful amount of funds to your fleet. You may need to come up with a creative approach. For example, consider the following strategies:
    - Apply for a smaller amount. For grant programs where cost-effectiveness is a factor, consider requesting only a portion of the incremental cost of the cleaner vehicle (*e.g.*, if a natural gas vehicle costs $25,000 more than an equivalent diesel vehicle, don't ask for $25,000, ask for $5,000 to $20,000). This strategy may not be necessary for the TFCA Regional Fund, but may be essential for the Carl Moyer Program.
    - Replace older engines. Because replacing old, "uncontrolled" diesel engines (especially pre-1987 engines) reduces more pollutants than replacing late model vehicles, replace older engines and vehicles tends to score higher in cost-effectiveness rankings. Since most fleet vehicles are newer than the average age of all diesel engines, other types of municipal diesel engines or vehicles owned by an entity that provides an essential public service may be better candidates for grant funding of diesel vehicle emissions reductions in your community.
    - Replace highly used engines. Look closely for opportunities to replace high-mileage vehicles or diesel engines that operate continuously. Since cost effectiveness evaluations are based on an engine's total annual pollutant emissions, replacing engines that operate the most tends to score higher in cost-effectiveness rankings.
    - Replace engines in neighborhoods with environmental justice issues. Equipment that spends most of its operating life in an "environmental justice" neighborhood has improved chance of receiving Carl Moyer grants. Such equipment could include street sweepers, garbage trucks, forklifts, pumps, maintenance equipment, or even fueling facilities that are located in the appropriate neighborhood.
3. Apply for grants. Not every opportunity is a good one for each municipality, but opportunities exist to obtain funding to support municipality fleet changes.

In addition to the above actions, municipalities that are not already doing so should consider active participation in their regional Clean Cities Coalition. Participating in the Clean Cities Coalitions does more than provide an opportunity to apply for Clean Cities grants. The Coalitions provide members with information about cleaner alternatives to diesel vehicles[16] and opportunities for funding assistance[17] to make purchase of those vehicles a reality.

5.0 Resources

Bay Area Dioxins Project participants have previously received copies of two relevant documents:

- BAAQMD published a *Guide to Low Emission Vehicles* that provides information about low-emission vehicles and most of the state-supported funding options for purchasing low-emission vehicles and related fueling infrastructure. The *Guide* is available on the Internet: www.baaqmd.gov/planning/plntrns/levs-01.pdf
- The U.S. Department of Energy's *Clean Cities Roadmap* outlines a strategy for promoting alternative fueled vehicles in a community. The *Roadmap* is available on the Internet: www.ccities.doe.gov/pdfs/roadmap2001.pdf

[16] For example, access to clean fuel users training available from the West Valley College Advanced Transportation Technologies Center (contact David Esmaili, 408-871-4393; www.westvalley.edu/wvc/att/).
[17] For example, proposed national energy legislation contains significant funds that could provide financial support for alternatives to municipal diesel fleet vehicles. DOE Clean Cities Coalitions will learn how to access these funds, if approved by Congress.

Table 1. Funding Sources for Municipal Purchase and Retrofit of Diesel Vehicles to Reduce Air Pollution

Grant program	Funding	Timing	Funded municipal diesel replacement/ retrofit in the past?	Summary
Transportation Fund for Clean Air (TFCA)				
TFCA Regional Fund Dave Burch 415-749-4641 dburch@baaqmd.gov www.baaqmd.gov/planning/ plntrns/tfcapage.htm	From Bay Area vehicle registration fee; about $10 million in 2002	RFP April, workshop May, due June	Yes, heavy-duty vehicles and EV fueling infrastructure. About half of 2001 funds spent on natural gas replacements for municipal heavy-duty diesel vehicles.	Regional Funds are distributed to public agencies through a competitive process. The primary project types receiving funding are low emission vehicles (gross vehicle weight more than 10,000 pounds), bicycle facility improvements, arterial management, smart growth, ridesharing, and shuttle services. This grant program is not for natural gas fueling infrastructure, light duty vehicles, or diesel retrofits. There are numerous special conditions for low-emission vehicles (see memo).
TFCA Basic Vehicle Incentive Program (Basic VIP) Dave Burch 415-749-4641 dburch@baaqmd.gov www.baaqmd.gov/planning/ plntrns/vip.htm	From Bay Area vehicle registration fee; about $900,000 in 2001	RPF August, due September	Yes, but only cars, vans, and pickup trucks (gross vehicle weight of 10,000 pounds or less).	The VIP program helps public agencies acquire low emission, alternative fuel vehicles (natural gas, propane, electric, and hybrid-electric) with a gross vehicle weight of 10,000 pounds or less. Grants are a fixed amount per vehicle, based on the type of vehicle. Grants are awarded in the order applications are received until funds are exhausted. Municipalities cannot receive more than $100,000 per year in VIP grants.

Table 1. Funding Sources for Municipal Purchase and Retrofit of Diesel Vehicles to Reduce Air Pollution (continued)

Grant program	Funding	Timing	Funded municipal diesel replacement/ retrofit in the past?	Summary
TFCA High-Mileage VIP (HMVIP) Dave Burch 415-749-4641 dburch@baaqmd.gov www.baaqmd.gov/planning/plntrns/vip.htm	From Bay Area vehicle registration fee; about $300,000 in 2001	RFP August, due October	Yes, but only cars, vans, and pickup trucks (gross vehicle weight of 10,000 pounds or less).	The HMVIP program provides incentives for vehicles that will be driven 60,000 miles per year or more. Municipalities may apply for up to $100,000 per year (in addition to any basic VIP program applications). If the total funds requested exceeds the funds allocated for the program, the BAAQMD awards the available funds to applicants on a pro-rated basis.
TFCA County Program Manager Funds Contact county administering agency (see memo)	From Bay Area vehicle registration fee; about $8 million in 2001	Distribution methods vary by county; annual cycle determined by County agencies (most select projects in the spring)	Yes, clean fuel vehicles and fueling infrastructure.	County Program Managers use their own criteria to select projects for funding. Program Managers who have a competitive grant application process may use cost-effectiveness as a criterion for project selection. In some counties, all or a portion of the Program Manager TFCA funds are allocated by formula as a direct subvention to cities within the county. For these funds, the city selects an eligible project or projects to receive TFCA funding.

Table 1. Funding Sources for Municipal Purchase and Retrofit of Diesel Vehicles to Reduce Air Pollution (continued)

Grant program	Funding	Timing	Funded municipal diesel replacement/ retrofit in the past?	Summary
Carl Moyer Program				
Carl Moyer Program - Incentives for Lower Emission Heavy Duty Engines (BAAQMD-managed portion) Michael Murphy 415-749-4644 mmurphy@baaqmd.gov Application materials (BAAQMD): http://www.baaqmd.gov/planning/plntrns/moyer.htm General information and statewide guidance (CARB): http://www.arb.ca.gov/msprog/moyer/moyer.htm	State funds, $1.5 million in 2001/02; future funding from Prop. 40 funds ($50 million allocated to Carl Moyer program for projects to reduce air pollution in state & local parks and recreation areas) or proposed new fee on oil (AB 2682 and SB 1994, proposed 2002)	RFP January, due February	Yes statewide, but rarely by BAAQMD (see memo). Since 1999, BAAQMD has partially funded replacement of 71 marine vessel engines, 2 locomotives, and 1 off-road and 13 on-road vehicles.	Available to private entities as well as agencies. Funds are for purchase of a new low emission vehicle, replacing an older engine with a newer one that exhibits lower emissions (repower), or retrofitting an existing engine to result in lower emissions. Only for heavy-duty engines (over 14,000 pounds gross vehicle weight), but for a wide range of applications (including on-road vehicles, off-road vehicles, locomotives, airport ground support equipment, stationary engines, and forklifts). To be eligible for the program, a new or retrofitted vehicle/engine must be certified to a lower NOx emission standard; a list of eligible retrofits and new vehicles is on the CARB web site.

Table 1. Funding Sources for Municipal Purchase and Retrofit of Diesel Vehicles to Reduce Air Pollution (continued)

Grant program	Funding	Timing	Funded municipal diesel replacement/ retrofit in the past?	Summary
Carl Moyer Program Inter-District Project Solicitation (CARB) http://www.arb.ca.gov/msprog/moyer/moyer.htm	State funds, $501,750 in 2001; (see above for discussion of future funding)	RFP January, due February	Unlikely (only municipalities operating in multiple air districts are eligible).	For heavy-duty diesel engines (locomotives, on-road vehicles and marine vessels) operating in more than one air district. Must operate at least 30% of the time outside of the home air district. Program is similar to the BAAQMD-administered portion (see above).
Heavy-Duty Alternative Fuels Infrastructure Program (California Energy Commission) Mr. Mike Trujillo California Energy Commission 916-654-4566 mtrujill@energy.state.ca.us www.energy.ca.gov/afvs/program_fact_sheets/fuel_infrastructure_demo.html	State funds, $2.5 million in 2000/01, were still being distributed in 2002; (see above for discussion of future funding)	Previous funds still being distributed as of April, 2002	No, but has funded fueling infrastructure.	Grants to are intended to support public and private installation of fueling infrastructure. Notice sent to local air districts; project participants (many are municipalities) partner with air districts to submit proposals to the CEC.

Table 1. Funding Sources for Municipal Purchase and Retrofit of Diesel Vehicles to Reduce Air Pollution (continued)

Grant program	Funding	Timing	Funded municipal diesel replacement/ retrofit in the past?	Summary
Fuels Infrastructure—California Energy Commission				
Alternative Fuels Infrastructure Program Alan Argentine California Energy Commission 916-654-4689 aargenti@energy.state.ca.us www.energy.ca.gov/ afvs/clean_fuel.html	State funds, $6 million in 2002	RFP January, due February	No, but has funded fueling infrastructure.	Grants to help build natural gas and propane refueling stations for public vehicle fleets in the state. CEC grant money will cover up to one-fifth the total cost of city, corporate, and other independent agency alternative fuel infrastructure projects.
Clean Cities-Related Grants				
Clean Cities State Energy Program, Special Projects, Transportation Technologies: Clean Cities/Alternative Fuels Peter Ward California Energy Commission 916-654-4639 pward@energy.state.ca.us www.energy.ca.gov/ afvs/clean_cities.html	DOE funding tied to Clean Cities Program, $4.5 million nationally in 2002 (can be as much as $18.5 million). CA received $840,000 in 2001	RFP December, due January to CEC and March to DOE	Yes, California municipalities have received funding for alternative fuel vehicles and LNG, CNG, and ethanol fueling stations.	Grants for fueling infrastructure, buses, Clean Cities coordinator positions, and "niche market alternative fuel vehicles," which include (but are not limited to) airport shuttle buses and vans, taxi fleets, cargo delivery vehicles, and local government fleets of refuse haulers, motor pools, and support operations vehicles. Only designated Clean Cities coalitions are eligible for funding (see memo; most Bay Area municipalities can join existing coalitions). Has significant cost share requirement (33 to 50%).

Table 1. Funding Sources for Municipal Purchase and Retrofit of Diesel Vehicles to Reduce Air Pollution (continued)

Grant program	Funding	Timing	Funded municipal diesel replacement/ retrofit in the past?	Summary
U.S. DOE Office of Energy Efficiency and Renewable Energy Broad Area Announcements – Office of Transportation Technologies Clean Cities Grants Julia Oliver DOE Oakland Duty Station Regional Clean Cities Program Manager 510-637-1952 julia.oliver@oak.doe.gov www.ccities.doe.gov/ toolbox/funding_ops. shtml#baa	About $1.5 million in 2002	RFP February, due May	Yes	Grant program has elements that depend on DOE's interests in a given year. Certain grants are only for Clean Cities Coalitions. In 2002, the Clean Cities grant solicitation was only for information, dissemination and outreach activities, specifically for: (1) co-sponsorship of conferences and events, (2) training for local clean cities coalitions, and (3) information dissemination and outreach for niche vehicle markets (see definition of "niche markets" above). Within the third element, some infrastructure funds are designated for installation of ethanol (E-85, 85% ethanol, 15% gasoline) fueling stations.

Table 1. Funding Sources for Municipal Purchase and Retrofit of Diesel Vehicles to Reduce Air Pollution (continued)

Grant program	Funding	Timing	Funded municipal diesel replacement/ retrofit in the past?	Summary
Potentially Appropriate Programs that are Currently Unfunded				
USEPA Clear Air Transportation Communities program USEPA Office of Transportation and Air Quality (OTAQ) www.epa.gov/oms/ transp/catc.htm	Federal funds. Not funded in 2002; future uncertain. In 2001, $1.27 million nationally	?	No.	Grant program for pilot projects that will spur reductions in transportation-related emissions of criteria pollutants and greenhouse gases by decreasing vehicle miles traveled and increasing the use of cleaner technologies. Intended to encourage projects that incorporate one or more of the following: (a) smart growth efforts to reduce transportation-related emissions; (b) commuter choice; and (c) green fleets/cleaner vehicles. Projects funded in 2001 involved education, enhancement of use of non-car transportation modes, and vehicle sharing programs.
USEPA Environmental Justice Through Pollution Prevention (EJP2) Grants www.epa.gov/opptintr/ ejp2/	No funding in 2002; future uncertain. In 2001, less than $1 million nationwide	?	Yes, in New England Region.	Grant funding is intended to support community-identified pollution prevention solutions to environmental problems in "environmental justice communities."
FAA Low Emission Airport Vehicle Grant Program www.faa.gov/arp/app600 /ileav/ileav.htm	No funding in 2002 (may have been one time pilot project). In 2001, $20 million	?	Yes.	Airport Improvement grant program for low emission airport vehicles provides 50 percent of the cost of low-emission vehicles as well as the cost of refueling and recharging stations, up to a total of $2 million for each airport. The 2001 grants created a pilot program for ten airports, including San Francisco Airport.

Table 3. Funding Sources for Municipal Purchase and Retrofit of Diesel Vehicles to Reduce Air Pollution--Grant Programs Only for Buses

Grant program	Funding	Timing	Funded municipal diesel replacement/ retrofit in the past?	Summary
Lower-Emission School Bus Program (BAAQMD) Michael Murphy (415) 749-4644 mmurphy@baaqmd.gov www.baaqmd.gov/planning/plntrns/schoolbus.htm	State of California funds, $66 million statewide for 2000/01 and 2001/02	Issued in October, due in November (but still accepting applications in April)	School buses only.	Available to public school districts for the purchase of new natural gas, propane or electric-powered school buses. Both public school districts and private school busing contractors may apply for funds for installing particulate matter control devices on school buses with diesel engines manufactured since 1994. In 2001, BAAQMD focused on school bus fleets in which pre-1987 buses comprise 70% or more of the fleet.
Congestion Mitigation and Air Quality Program (CMAQ) Managed by county administering agency (see memo), with final approval by MTC	Federal transportation funds, about $57 million for SF Bay Area in 2001/02	Distribution methods vary by County; many agencies consider these funds together with Surface Transportation Program (road) funds	Transit buses only.	Public agencies - cities, counties, transit operators, and Caltrans are eligible. Most funds go to road or transit projects. The types of projects funded vary significantly by county. Federal funding source requires that money be spent on projects that reduce ozone, carbon monoxide, or PM-10 from transportation sources.

Table 3. Funding Sources for Municipal Purchase and Retrofit of Diesel Vehicles to Reduce Air Pollution--Grant Programs Only for Buses (continued)

Grant program	Funding	Timing	Funded municipal diesel replacement/ retrofit in the past?	Summary
Clean Fuels Formula Grant program (Federal Transit Administration) (No contact information)	Federal funds, $0 allocated nationally in 2001/02; (the $50 million or more allocated to the Clean Fuels Formula Program funds has been transferred each year by Congress to the Bus and Bus Facilities Capital Investment Program)	Program has never been implemented	No, but intended to fund transit buses.	Purchase or leasing of clean fuel buses and facilities, upgrade of existing facilities for clean fuel buses. Intended to improve air quality and to support emerging technologies and create markets for new clean fuel technologies. It appears that this approved grant program has never been funded.

Table 4. Regional TFCA Grants to Dioxins Project Municipalities, 2000/01 and 2002/02

Municipality	Project	Funds
Alameda County	Class 2 Bicycle Lane (1.0 mi.)	$70,000
Alameda County	Arterial Management, Hesperian Boulevard & Redwood Road	$45,000
Berkeley	Bicycle Boulevards, Russell and Ninth St. (4.78 mi.)	$131,500
Berkeley	Natural Gas Vehicle Purchase, 1 Mini Bus	$35,000
Berkeley	Natural Gas Vehicle Purchase, 7 Refuse Trucks	$350,000
Oakland	Bicycle Rack Program, 150 racks	$16,450
Oakland	Natural Gas Vehicle Purchase, 1 Refuse Truck	$50,000
Oakland	Pedestrian Streetscape Enhancement, Fruitvale Transit Village	$551,375
Oakland	Natural Gas Vehicle Purchase, 10 Refuse Trucks	$394,812
San Francisco	Natural Gas Vehicle Purchase, 15 LNG/Diesel trucks	$965,000
San Francisco	Natural Gas Vehicle Purchase, 18 Trucks	$900,000
San Francisco	Airport Commission Natural Gas Vehicle Purchases, 34 Mini Buses and 4 Buses	$980,000 $140,000
San Francisco	Bicycle Racks, 700 bicycle capacity; Port Bicycle Racks, 1000 bicycle capacity	$97,600 $85,000

Table 5. County Program Manager TFCA Grants to Dioxins Project Municipalities, 2001/02

Municipality	Project	Funds
Oakland	City of Oakland Bicycle Route Signage	$102,546
Oakland	Bicycle Parking Request Program (City Racks III)	$7,000
Oakland	East Lake Streetscape and Pedestrian Enhancement Program	$200,000
Palo Alto	CNG Fueling Facility	$300,000
Palo Alto	Homer Avenue Caltrain Undercrossing	$150,000
San Francisco	Golden Gate Park CNG Fueling Facility	$50,000
San Francisco	MUNI CNG Fueling Facility	$500,000
San Francisco	Cesar Chavez CNG Fueling Expansion	$100,000
San Francisco	Electric Vehicles for Golden Gate Park	$9,000
San Francisco	Clean Air Vehicle Replacement	$99,000
San Francisco	Hall of Justice Shuttle	$55,000
San Francisco	Bicycles for Gardeners	$28,000
San Francisco	Caltrain Bike Station	$18,000
San Francisco	Bicycle Parking Enforcement Program	$57,000

APPENDIX A. DIESEL ALTERNATIVES CASE STUDIES

This appendix contains descriptions of the projects listed below.

Case Studies from Municipalities Participating in the Bay Area Dioxins Project

Case Studies from Other Agencies

Alameda County Public Works Agency (PWA) Clean Air Vehicle Projects

Source: prepared by Pamela Evans, Environmental Health Department with information provided by Tom Gannon, Fleet Manager, phone 925-803-7006.

Alameda County PWA has carried out a number of 'clean air' vehicle replacement projects since 1999. It has used a Bay Area Air Quality Management District grant to replace a diesel-powered street sweeper with a compressed natural gas (CNG) unit in the Livermore valley area. PWA has used another 'clean air' grant to replace 12 gasoline-fueled passenger cars and trucks with CNG vehicles. Currently, two electric vehicles are on order to replace gas-powered models. In the coming year, PWA will research, and if feasible, implement, a biodiesel fuel pilot project. This case study focuses on the street sweeper and biodiesel initiatives.

CNG Street Sweeper – East County

The CNG street sweeper is housed at the County's state-of-the-art Dublin facility, the sole source of CNG for county vehicles. (County vehicles are fueled only at county facilities.) Due to its limited range, the sweeper services only the Dublin/Pleasanton/Livermore area. As this area suffers the worst overall air quality in Alameda County, it is considered optimal to host a CNG sweeper. The cost of the new CNG sweeper was $151,000, $40,000 more than a comparable diesel-powered model.

While the CNG sweeper has worked reasonably well in the field, it suffered major motor damage in December 2001, when a CNG fuel regulator malfunctioned, allowing excess fuel to enter and blow out a piston, requiring $20,000 in repairs. Although staff has been trained to avoid a recurrence of this problem, the fleet manager anticipates that other misuse mishaps may occur due to working with relatively untested equipment. To prevent, or at least recoup, County costs associated with such problems, PWA takes advantage of enhanced manufacturer endurance-testing protocols and a 100,000-mile warranty.

PWA's Dublin facility had a CNG dispenser for other uses when it obtained the CNG-powered sweeper, so PWA did not incur costs for a new fuel system. A copy of the fuel consumption and vehicle maintenance costs tracking table is on the next page. PWA did not monitor changes in emissions between old and new street sweepers, but did obtain estimates from the original BAAQMD grant proposal announcement. These estimates were not available for this report.

The fleet manager will evaluate the pilot CNG sweeper project and make a decision about expanding it to cover other parts of the County. Expansion would require installation of new fuel dispensing equipment at other County fueling facilities, so those costs would have to be considered in addition to the price of a new sweeper.

Biodiesel Pilot

In the coming year, PWA will study and possibly implement a biodiesel pilot project at the Dublin facility. PWA's fleet uses approximately 90,000 gallons/year of diesel fuel. The plan for the pilot would be to replace 60% of this volume with biodiesel in the first year, followed by replacing the remaining 40% and including a second County facility (in Hayward) in the second year. This change would involve up to 300 vehicles in the first year, and up to 450 by the end of the second year. More than 500 employees would be

involved in the full implementation. Biodiesel currently costs 25 to 29 cents more per gallon than regular diesel, so the cost associated with the new fuel itself over two years is expected to be approximately $45,000 to $52,200.

6/13/00

BAAQMD Final Report for Project # 96R125 and 96R126
for Alameda County Public Works Agency

Reporting Period is from April 1999 Through May 2000

Fuel Consumption Data Apr 1999 Thru May 2000						Fuel	Miles	Total Gals	Total Cost	Avg Cost	MPG	CPM
Veh #	Make	Model	VIN	Year	Engine	Type	Drivn	Life	Life	Per Gallon		Maint & Fuel
A80N	HONDA	CIVIC	1HGEN1644WL000423	1998	1.6 L 4 Cyl	CNG	2068	140.4	309.60	2.21	14.7	0.507
A81N	HONDA	CIVIC	1HGEN1642WL000453	1998	1.6 L 4 Cyl	CNG	4136	197.5	480.10	2.43	20.9	0.258
A82N	HONDA	CIVIC	1HGEN1646WL000424	1998	1.6 L 4 Cyl	CNG	1400	69.6	155.20	2.23	20.1	0.718
A83N	HONDA	CIVIC	1HGEN1648WL000425	1998	1.6 L 4 Cyl	CNG	2362	40.4	49.80	1.23	58.5	0.455
A84N	HONDA	CIVIC	1HGEN1648WL000456	1998	1.6 L 4 Cyl	CNG	3550	183.1	395.80	2.16	19.4	0.563
A85N	FORD	CROWN VICTORIA	2FAFP7398XX122213	1999	4.6 L V-8	CNG	5984	475.3	436.20	0.92	12.6	0.211
A86N	FORD	CROWN VICTORIA	2FAFP739XXX122214	1999	4.6 L V-8	CNG	7937	512.6	434.80	0.85	15.5	0.195
K80N	FORD	F250	1FTPF27M4WKC25651	1998	5.4L Triton V-8	CNG	6270					1.057
K81N	FORD	F250	1FTPF27M6WKC25652	1998	5.4L Triton V-8	CNG	8312	388.9	579.10	1.49	21.4	0.835
K82N	FORD	F250	1FTPF27M8WKC25653	1998	5.4L Triton V-8	CNG	5068	470.1	339.80	0.72	10.8	0.666
K83N	FORD	F250	1FTPF27MXWKC25654	1998	5.4L Triton V-8	CNG	8212	1517.9	2264.70	1.49	5.4	1.046
K84N	FORD	F-250	1FTPF27M2WKC25650	1998	5.4L Triton V-8	CNG	4935	755.1	446.30	0.59	6.5	0.490
S87F	MOBILE	M-9D CNG	1A9Z24CR5VR059006	1997		CNG	6128	2811.8	4195.70	1.49	2.2	5.364
					Fleet Average		66362	5943.8	7825.6	1.32	11.2	1.018

Vehicle Maintenance Cost Data Apr 1999 Thru May 2000						Fuel	Miles	Repair Labor	Repair Parts	PM Labor	PM Parts	Total Maint
Veh #	Make	Model	VIN	Year	Engine	Type	Drivn	Cost	Cost	Cost	Cost	Cost
A80N	HONDA	CIVIC	1HGEN1644WL000423	1998	1.6 L 4 Cyl	CNG	2068	$ 385.00	$ 214.51	$ 115.50	$ 23.36	$ 738.37
A81N	HONDA	CIVIC	1HGEN1642WL000453	1998	1.6 L 4 Cyl	CNG	4136	$ 343.48	$ 111.85	$ 115.50	$ 14.85	$ 585.68
A82N	HONDA	CIVIC	1HGEN1646WL000424	1998	1.6 L 4 Cyl	CNG	1400	$ 505.56	$ 215.12	$ 115.50	$ 13.38	$ 849.56
A83N	HONDA	CIVIC	1HGEN1648WL000425	1998	1.6 L 4 Cyl	CNG	2362	$ 462.00	$ 192.75	$ 346.50	$ 24.38	$ 1,025.63
A84N	HONDA	CIVIC	1HGEN1648WL000456	1998	1.6 L 4 Cyl	CNG	3550	$ 908.61	$ 563.97	$ 115.50	$ 15.82	$ 1,603.90
A85N	FORD	CROWN VICTORIA	2FAFP7398XX122213	1999	4.6 L V-8	CNG	5984	$ 385.00	$ 268.34	$ 154.00	$ 18.70	$ 826.04
A86N	FORD	CROWN VICTORIA	2FAFP739XXX122214	1999	4.6 L V-8	CNG	7937	$ 689.98	$ 111.83	$ 269.50	$ 39.87	$ 1,111.18
K80N	FORD	F250	1FTPF27M4WKC25651	1998	5.4L Triton V-8	CNG	6270	$ 2,330.07	$ 4,052.88	$ 192.50	$ 51.53	$ 6,626.98
K81N	FORD	F250	1FTPF27M6WKC25652	1998	5.4L Triton V-8	CNG	8312	$ 3,195.50	$ 2,876.30	$ 231.00	$ 56.95	$ 6,359.75
K82N	FORD	F250	1FTPF27M8WKC25653	1998	5.4L Triton V-8	CNG	5068	$ 885.50	$ 1,983.15	$ 154.00	$ 15.03	$ 3,037.68
K83N	FORD	F250	1FTPF27MXWKC25654	1998	5.4L Triton V-8	CNG	8212	$ 3,255.15	$ 2,832.15	$ 192.50	$ 44.31	$ 6,324.11
K84N	FORD	F-250	1FTPF27M2WKC25650	1998	5.4L Triton V-8	CNG	4935	$ 462.00	$ 1,377.71	$ 115.50	$ 16.08	$ 1,971.29
S87F	MOBILE	M-9D CNG	1A9Z24CR5VR059006	1997		CNG	6128	$ 13,314.11	$ 13,707.84	$ 1,155.00	$ 500.53	$ 28,677.48
					Fleet Totals		66,362.0	$ 27,121.96	$ 28,508.40	$ 3,272.50	$ 834.79	$ 59,737.65

The biggest complaint we receive from drivers of the CNG vehicles is the driving range and lack of fueling infrastucture. We operate 1 fast fill station at our Dublin location which has been working well but there is no close facility in our Hayward location. Hayward Unified School District is planning a facility which will be in close proximity of our Hayward location and should help relieve this situation. The vehicles performance has been good.

We are planning to install slow fill Fuel Makers at our Turner Ct location in Hayward which should also help increase the use of the vehicles.

Report by Tom Gannon Fleet Manager, Alameda County Public Works

Alameda County General Services Agency (GSA) Purchases Cleaner Burning Diesel

Source: prepared by Pamela Evans, Environmental Health Department with information provided by Tom Fung, Manager of Alameda County Motor Pool, GSA, phone 510-272-6401.

Alameda County GSA purchases approximately 140,000 gallons of diesel per year for County diesel fuel tanks (all tanks other than those operated by the Fire Department). GSA is now finalizing a contract for 100% replacement of its #2 diesel with "cleaner-burning" (ultra-low sulfide) fuel. This new diesel formulation will carry a price differential of 5 cents more per gallon. Motor Pool does not expect a significant change in vehicle or dispenser performance from the fuel switch and no retrofitting will be required of either the vehicles or the storage and dispensing equipment. The costs of the switch will include researching and implementing the new contract, changing dispenser signage and an increase of 5 cents per gallon in the cost of fuel. The incremental cost of the cleaner diesel fuel is expected to total approximately $7,000 per year.

Alameda County General Services Agency Motor Pool Lays Groundwork for Possible Use of Biodiesel

Source: prepared by Pamela Evans, Environmental Health Department with information provided by Tom Fung, Manager of Alameda County Motor Pool, GSA, phone 510-272-6401.

Most of Alameda County GSA Motor Pools' 1,000 vehicles are gasoline-powered passenger cars and trucks, so fuel conservation and environmental preservation efforts are focused primarily on the purchase of fuel-efficient and/or alternative fuel vehicles. Only about 100 Motor Pool vehicles are diesel-fueled, and of this number, most are specialized equipment such as prisoner transport buses and emergency search and rescue vehicles. Motor Pool operates two diesel fueling stations, in Oakland and in Dublin. These sites pump approximately 50,000 gallons of diesel fuel to Motor Pool vehicles.

Meanwhile, Motor Pool is laying the groundwork for at least a partial switch to biodiesel. The Public Works Agency, a bigger diesel user, will be the first to run a biodiesel pilot project, and Motor Pool will monitor this pilot carefully. In addition, Motor Pool has formulated plans to help attract a biodiesel distribution center to Alameda County, expecting to reduce fuel prices while increasing business development and job opportunities in the County. Motor Pool's leadership and staff share a strong interest in tracking and implementing cleaner fuel options for its fleet. Motor Pool is committed to working with other County offices and suppliers to develop opportunities to reduce fuel consumption, enhance business and employment opportunities, preserve the environment and protect public health.

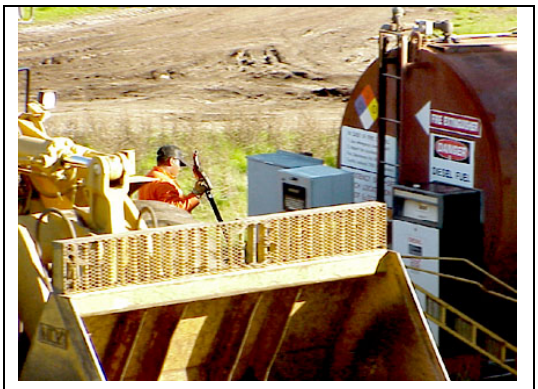
City of Palo Alto Pilots Biodiesel Fuel at Landfill and Golf Course

Source: City of Palo Alto

Introduction

Biodiesel is like diesel fuel except it is produced from natural renewable resources—vegetable oils, such as soy, canola, tallow and restaurant greases. There are two general categories of biodiesel use: 100% biodiesel ("B100") and a blend of 20% biodiesel with 80% petroleum diesel ("B20").

Biodiesel is currently more expensive than petroleum diesel. Some organizations are using B20 because it is much less expensive than B100. The cost differential between biodiesel and petroleum diesel is expected to decline within the next 5 years.



City of Palo Alto staff person fueling landfill equipment with B20, the 20% biodiesel blend

Benefits of Biodiesel

Made from cooking oils and alcohol, biodiesel is biodegradable and very safe to handle. Biodiesel has a high flashpoint of about 300ºF, compared to petroleum diesel's flashpoint of 125ºF. If biodiesel spills on the ground, it will quickly degrade into natural organic residues.

The use of biodiesel can extend the life of diesel engines because it is more lubricating than petroleum diesel fuel. Biodiesel is 11% oxygen, which means that even in a blend such as B20, the oxygen content assists in the combustion of the hydrocarbons.

Biodiesel reduces air pollution and reduces greenhouse gas emissions. The exhaust from biodiesel smells much better than diesel exhaust. The table below presents the emission differences of B100 and B20 relative to diesel. Because there is no sulfur in biodiesel, in does not contribute to sulfur dioxide emissions. B20 provides about 20% of the benefits of pure biodiesel. B20 can also reduce the soot and smell of diesel exhaust.

Biodiesel Fuel Combustion Pollutant Emissions

Emission	B100	B20
Carbon monoxide	-43.2%	-12.6%
Hydrocarbons	-56.3%	-11.0%
Particulates	-55.4%	-18.0%
Nitrous oxides	+5.8%	+1.2%
Air toxics	-60 to 90%	-12 to 20%
Mutagenicity	-80 to 90%	-20%

(From "Biodiesel for the Global Environment" produced by the Dept. of Energy, May 2000.)

Palo Alto's Program

In Summer 2001, Palo Alto began piloting the use of B20 in heavy equipment at the City's landfill. Prior to filling the landfill's 5,000-gallon aboveground diesel fuel storage tank with biodiesel, the tank was completely drained. After draining, a person entered the

tank to scrape, brush and wash collected deposits and sludge from the interior. This step is necessary because biodiesel is a more aggressive solvent than is petroleum-based diesel, and it tends to loosen deposits from the interior of fuel tanks and lines. In addition to cleaning the main storage tank, the fuel filters on each piece of equipment were changed twice over a period of two to three weeks. These filter changes are required to prevent the filter(s) from plugging with debris that can be suddenly loosened from the vehicle's fuel tank and fuel lines. The cost of cleaning the main storage tank and replacing the fuel filters on six pieces of equipment was approximately $5,000.

In the summer of 2002, City's street sweepers will begin using the B20 blend. In order to help expedite this change, biodiesel fuel will be made available at the Golf Course fueling facility, following the same procedure that was used at the landfill. After the City's new main fleet fueling facility is completed (summer 2003), all of the remaining diesel fueled fleet vehicles will be "converted" to run on biodiesel. The new fueling facility will include two separate diesel storage and dispensing systems, so that both regular diesel and biodiesel will be available until the biodiesel conversion program is complete. All vehicles (with the exception of brand-new units) require some degree of work to "convert" them to run on biodiesel. The "conversion" process consists of evaluating a vehicle to determine if the fuel system is fully compatible with biodiesel fuel, changing seals and fuel lines if necessary, and performing several fuel filter changes over a period of two to three weeks (as noted in the above paragraph). Even with these precautions, problems may still occur. Given the amount of work and monitoring required, it is not practical to make a fleet wide conversion to biodiesel all at once. The conversion must be phased in over a period of several months.

Standby generators will also be included in the conversion program, although these are lower priority because of their relatively infrequent usage.

Issues

During program start-up the primary issues for Palo Alto were cost, availability, cleaning of storage tanks, and the effect of the product on the engine seals (biodiesel can degrade rubber seals).

- Availability: At the time Palo Alto made the decision to pilot the use of biodiesel, Olympian Oil (San Francisco) was the exclusive distributor of biodiesel in Northern California. Although Palo Alto does not purchase fuel from Olympian, it was able to persuade its current fuel vendor (Valley Oil) to purchase B100 biodiesel from Olympian. Valley performs the blending (to B20) on site.
- Tank Cleaning: Most large service-station maintenance contractors provide this service. Palo Alto's current contractor is Petrotek, Incorporated.
- Engine Seals: Compatibility with engine seals and fuel lines was confirmed with equipment manufacturers. Most equipment manufactured after 1990 can use biodiesel without modification.

Project Costs

Biodiesel is currently more expensive than petroleum-based diesel. Palo Alto and other organizations are using B20 because it is less expensive than B100. The B20 blended

fuel costs about 4 to 6 cents more per gallon than traditional diesel fuel. The cost differential between biodiesel and petroleum diesel may decrease within the next 5 years.

Evaluation Data

Reliance on traditional diesel is among the City of Palo Alto's metrics for evaluating the reduction of dioxin and other air pollutants in its community. The table below presents the diesel purchases in 2000 (baseline) and 2001. The biodiesel purchased in 2001 began in summer 2001 and consisted of 20% biodiesel blended with traditional diesel. Assuming the biodiesel continues to perform well and that the biodiesel costs decrease, this metric should continue to show increased use of biodiesel.

City of Palo Alto Purchases of Diesel and B20 (20% Biodiesel, 80% Diesel)

Year	Diesel (gal)	B20 Blend (gal)
2000	137,132	0
2001	142,189	5,593

Future Plans for Biodiesel in Palo Alto

B20 will be used as long as it is economically viable, and the emissions reductions are competitive with the emissions reductions achievable with other fuels, such as ultra-low sulfur diesel. B100 is not currently being considered, due to the prohibitive cost (more than $3.00 per gallon). However, if the price of B100 decreases significantly, a limited B100 pilot program may be implemented.

Contact Information

Keith LaHaie, Fleet Manager, City of Palo Alto
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Phone: 650-496-6948

Port of Oakland Vision 2000 Maritime Development Program – Air Quality

Source: Port of Oakland

Overview

On April 20, 1999, the Port of Oakland approved spending $8.9 million in air quality mitigation projects. This Program is known as the Vision 2000 Air Quality Mitigation Program (V2K AQMP). Nineteen air quality improvement programs and projects have been adopted by the Port of Oakland. These include:

- Subsidizing the cost of repowering and retrofitting diesel truck engines;
- Implementing a demonstration project installing add-on emission control devices on local trucks;
- Funding the engine replacement and equipment retrofit on container terminal equipment ("Container Terminal Equipment Repower and Retrofit Program")
- Repowering one tugboat with low-emission diesel engines as a demonstration project.
- Subsidizing the replacement of twenty-seven two-stroke diesel engines in local transit buses with new, low-emission diesel engines equipped with diesel particulate traps.
- Funding an engineering study to determine whether cost-effective measures exist to control volatile organic carbon emissions at a local metal casting plant.
- Other measures, such as designing tugboat wharves to enable "cold ironing".

The Vision 2000 Air Quality Mitigation Program comprises four phases:

- In Phase I (April 1999 to November 2000), the Port devoted resources to refining its overall strategic approach to the program, building advanced technical knowledge and expertise, designing specific implementation procedures for individual mitigation measures and implementing and reporting on specific measures.
- Phase II of the program (December 2000 to April 2002) will be characterized by continued implementation of program components. Concurrently, Port environmental staff anticipate assessing the performance of Phase I of the program. The evaluation will be used to guide modifications to the entire program, including strategic approaches, procedures and future projects.
- In Phases III and IV (April 2002 to April 2005) coincident with completion of the Vision 2000 Maritime Development Program, the Port intends to implement any outstanding mitigation elements. The Port anticipates that most of the principal measures will have been fully implemented by then.

Goals And Objectives Of The Vision 2000 Air Quality Mitigation Program

The overall goal of the Vision 2000 Air Quality Mitigation Program is "maximize the quantity of emissions reduced for the dollars spent, with a preference for reducing diesel particulates (PM) and for measures that will reduce local near-Port emissions" (Resolution # 99153). Additional program goals are:

- Improved tenant relations.
- Improved worker health and safety.
- Improved community quality of life.
- Foster the installation of the most advanced emission control technologies for maximum air emission reductions.

For more information please contact Mr. Harold Jones, Manager Governmental Affairs at (510) 627-1564; Mr. Richard Sinkoff, Port Environmental Assessment Supervisor at (510) 627-1182, and Marucia Britto, Port Environmental Planner at (510) 627-1104.

Project Facts

Transit Bus Repower And Retrofit Program

- On December 16, 1999, the Port paid $659,124 to the Alameda-Contra Costa Transit District (AC Transit) to "jump-start" its on-going bus repower and retrofit program.
- The grant subsidizes the replacement of two-stroke engines with new, low-emission diesel engines on 27 AC Transit buses.
- Additionally, the buses will be equipped with catalytic soot filters.
- After full implementation, the project will reduce nitrogen oxides by 39.7 tons and particulate matter by 3.9 tons.
- The project immediately reduces emissions caused by AC Transit buses until more advanced technology, such as hybrid-electric and fuel-cell powered transit buses become economically and technically feasible.
- To date, seven buses have been repowered and retrofitted. Five are currently being repowered.

Tugboat Repower Project

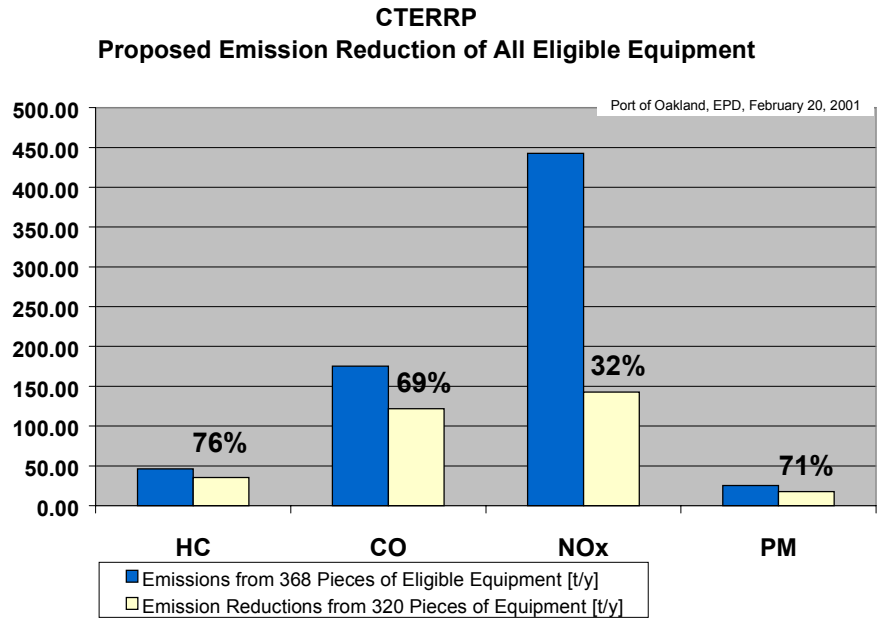
- The Port created an incentive based funding program to repower and/or retrofit one or more tugboats that provide services to Port tenants.
- On July 18, 2000, the Board of Port Commissioners approved funding the engine replacements of two 2-stroke diesel engines with two modern, electronically controlled, low-emission marine diesel engines.
- The Port's funding of $408,300 covers half of the cost of purchase and installation of these engines.
- The projected emission reductions are 0.9 tons particulate matter and 26 tons nitrogen oxides per year.
- The overall emission reduction over the project lifetime (16.5 years) will be 15.5 tons of particulate matter and 431 tons of nitrogen oxides.

Container Terminal Equipment Repower and Retrofit Program

- The Port created an incentive based grant program, the Container Terminal Equipment Repower and Retrofit Program (CTERRP) that provides funding for

engine replacements and installation of emission control technologies on maximum 368 pieces of container handling equipment.

- All marine terminal operators at the Port of Oakland submitted funding applications in December 2000. The grant agreements are currently being signed.
- Marine terminal operators (MTO) propose to repower more than 150 pieces of equipment with new, low-emission diesel engines.
- Additionally, MTO applied for funding to install approximately 150 diesel oxidation catalysts and 150 diesel particulate filters. Fifty percent of the MTO propose to start using ultra-low-sulfur diesel in year 2000.
- With full implementation of Tier 1, the CTERRP will reduce particulate matter emissions from all eligible pieces of equipment by over 70%.
- Nitrogen oxides will be reduced by over 30%. This reduction is mostly related to engine replacements.
- Hydrocarbons, many of which are toxic or carcinogenic, will be reduced by nearly 80%.
- This represents a reduction of 60 tons of particulate matter, more than 470 tons of nitrogen oxides and more than 150 tons of hydrocarbons over the project lifetime.
- The Port will have submitted grants under Tier 1 in the amount of approximately $3.5 million in order to achieve the projected emission reductions.



Port of Oakland Bus Re-Powering Project

Source: Joan P. Martin, Manager, Capital Planning & Grant Administration, Alameda-Contra Costa Transit District, Final Progress Report No. 4, September 21, 2001

Bus Re-Powering Project Progress Report No. 4

March 16, 2001 – September 30, 2001

Background:

On December 15, 1999, the Alameda-Contra Costa Transit District entered into a Memorandum of Understanding (MOU) with the Port of Oakland to provide funding to partially fund the District's re-powered engine project. The District received a check from the Port of Oakland totaling $659,124. These funds will be utilized to retrofit approximately 27 buses that will service West Oakland and adjacent communities.

Prior Period – 3/16/00 – 3/16/01

On August 4, 2000 the District awarded a sole source contract to Gillig Corporation who will provide the repower kits needed for the Gillig buses that will be repowered as part of this project. A second contract was awarded on August 4, 2000 to Cummins West, who will provide the replacement engines for the project.

List of Buses Completed as of 3/16/01:

Bus No.		Model Year/Engine Type	No. Of Miles on Old Engine
1	2801	6VF201290	322,652
2	2803	6VF200489	110,071
3	2806	6VF200488	327,290
4	2808	6VF200486	326,191
5	2809	6VF200234	295,762
6	2811	6VF200341	327,715
7	2817	6VF200540	323,636
8	2821	6VF200743	308,935
9	2822	6VF200735	317,479
10	2830	6VF200737	296.394
11	2833	6VF200746	327,423
12	2838	6VF200953	321,103
13	2842	6VF200949	268,350
14	2843	6VF200945	308,454
15	2844	6VF200981	276,968
16	2845	6VF200747	314,496
17	2847	6VF200738	318,213
18	2852	6VF200748	331,677
19	2854	6VF202326	159,000
20	2856	6VF201144	308,935

All the above had Detroit Diesel 6V92TA engines (275 hp) that were replaced with Cummins ISM 280 hp engines.

Final Period – 3/17/01 – 9/30/01

As of this report this project is complete. A total of 28 buses were re-powered under this project. All of the funds have been expended.

List of Buses Completed This Period – 3/17/01 – 9/30/01

Bus No.		Model Year/Engine Type	No. Of Miles on Old Engine
21	2810	6VF200541	307,957
22	2816	6VF200485	348,566
23	2818	6VF200483	279,769
24	2826	6VF200328	329,022
25	2829	6VF200740	306,725
26	2840	6VF201148	353,744
27	2849	6VF201167	289,281
28	2858	6VF201146	333,456

City of Cincinnati Bus Biodiesel Demonstration Project

Sources: Bruce Suits, Pollution Prevention Manager, City of Cincinnati, August 2000 and Griffin Industries Press Release, July 2000

In 2000, the City of Cincinnati's Queen City Metro bus system powered more than 280 buses on biodiesel during July and August. The buses ran about 2,500,000 miles on regional roadways using the alternative fuel. Griffin Industries supplied the biodiesel—500,000 gallons of B20, a blend of 20% biodiesel mixed with 80% petroleum diesel. Griffin produces biodiesel from recycled vegetable oil collected from area restaurants.

The City of Cincinnati's Pollution Prevention Manager Bruce Suits obtained the following information about the project:

- From Sally Hilvers of Queen City Metro (bus line). "She said that the buses are running well with the alternative fuel, with good mileage and performance (including power, which is important on Cincinnati's hills!). One small snag, which actually may be a cloud with a silver lining, is that biodiesel fuel evidently cleans engines so well that Metro has had a few instances of clogged fuel filters. Once the filters are changed the engines are fine. Ms. Hilvers said that test results for efficiency improvements and emissions reductions will be available after the project's completion."
- From Rick Geise, Director of Marketing for Griffin Industries (the biodiesel supplier), "who suggests a filter change after the first two tanks of the fuel to avoid clogging. I assume that biodiesel use in a new vehicle would avoid the problem altogether because you would start with a 'clean' engine. Mr. Geise says the fuel cost is competitive and getting better."

Queen City Metro also participated in a soy diesel demonstration project in 1993-94. The cost of soy diesel then was about $4.00/gallon. In 2000 it was about $2.50/gallon. In 2000, Metro could purchase regular diesel at about $0.52/gallon, and the biodiesel was about $1.49/gallon. Mr. Geise said that biodiesel production hasn't yet experienced economies of scale, so the price may actually line up with regular diesel in the near future.

City of Sunnyvale Natural Gas Recycling Trucks

Source: City of Sunnyvale staff report to City Council, December 12, 2000 (verbatim excerpts)

Summary

The Bay Area Air Quality Management District has approved a City of Sunnyvale application for a $1 million grant from the Transportation Fund for Clean Air. The grant funds will pay for the majority of the cost of converting 20 new garbage, yard waste, and recycling collection trucks to use clean air fuels instead of diesel. The trucks, to be purchased by Bay Counties Waste Services, are scheduled replacements of an equivalent number of trucks that will reach the end of their useful lives during the period 2001-2003. Total estimated cost of converting the 20 vehicles to clean air fuel is $1,722,957. The estimated $722,957 in excess of the grant will be paid to Bay Counties Waste Services by the City over the seven-year life of the new trucks as part of the company's contractor payment.

Background

Bay Counties Waste Services (BCWS) collects garbage, yard trimmings, and recyclable materials under a long-term contract with the City. Under the contract, BCWS's compensation is calculated through a complex contractor payment review process each year. The depreciation cost of the company's collection trucks is incurred in the purchase year of the vehicle and spread over the seven-year life of the truck. The depreciation cost then becomes part of the City's cost through the yearly contractor payment. Thus, the City will absorb the cost of converting the trucks to compressed natural gas through the contractor payment process.

BCWS operates a total of approximately 40 trucks in a given day, collecting various types of materials. The contract includes a vehicle replacement schedule that spells out which trucks are to be replaced during which years of the contract term. Generally, trucks are replaced (or moved into a backup role) after they have been in use for 7 years. The number of trucks to be replaced in a given year varies. For example, only one truck was replaced during FY 1999/2000, while 4 trucks are scheduled for replacement in FY 2000/2001, 17 trucks are scheduled for replacement in FY 2001/2002, and 3 trucks are scheduled for FY 2002/2003.

City of Sunnyvale Action

Several years ago, BCWS and City staff began to discuss how the unusually large number of trucks to be replaced from FY 2000/2001 to FY 2002/2003 created an opportunity to begin making use of alternative fuels. This is because the economics of installing the necessary fueling system make it beneficial to operate more, rather than fewer, alternate fuel vehicles. BCWS and City staff began researching the various chassis and drive train options, visited sites where alternative fuels were used to power refuse trucks, and investigated fueling options. Following this research, BCWS recommended that the City consider allowing the replacement vehicles to be powered by natural gas engines.

A separate, prior grant application for $200,000 to offset the cost of converting was approved by the Valley Transportation Agency, acting as a Local Transportation Agency on behalf of the BAAQMD. This money is being used to offset part of the incremental

cost of purchasing four new recycling collection trucks that are powered by natural gas instead of diesel.

The incremental cost of specifying alternative fuel engines for the 20 trucks in question is estimated to be a total of $1,722,957. The BAAQMD has approved the City's TFCA grant proposal, which will reimburse a maximum of $50,000 per truck. These grants are typically made available only to governmental agencies that purchase vehicles for their own use. However, an exception to this rule allows governmental agencies to obtain grant funding for vehicles that are purchased privately but are used for "an essential public service," a category that includes solid waste and recycling collection contracted through a city, as in this case. The remaining cost [not funded by the grant] is $722,957, which will be amortized over the 7-year life of the trucks. The $722,957 will be matching funds from the City of Sunnyvale. The refuse collection rate impact of the City's matching contribution is expected to be 0.2% in fiscal year 2001/2002.

Yellowstone National Park Biodiesel Truck

Source: Jim Evanoff, Yellowstone National Park Ranger, October 2000

The Montana Department of Environmental Quality (DEQ) in partnership with the Department of Energy (DOE), Yellowstone National Park and the University of Idaho successfully demonstrated the use of an alternative fuel in Yellowstone. The fuel is rapeseed (canola) ethyl ester, produced from rapeseed oil reacted with ethanol that is made from potato waste generated by the food processing industry. Yellowstone National Park offered a unique opportunity to demonstrate this low emission, biodegradable fuel in an environmentally sensitive and extremely cold area.

In February 1995, Dodge Truck Inc. donated to the project a new 1995 3/4 ton 4x4 pickup ($30,000 value). Since that time, the truck, driven by Yellowstone employees, has gone over 100,000 miles on 100% biodiesel. It averages about 17 miles per gallon, the same as when it was tested with regular diesel fuel during baseline data development. No modifications were made to the truck's engine or fuel system. The emissions test conducted on the truck showed that smoke, hydrocarbons, nitrogen oxides and carbon monoxide were reduced by using the biodiesel. Tests also showed that the sweet odor of biodiesel exhaust does not attract bears, which was a concern to park managers. The park developed an extensive education program for the public. Lectures and information exchanges have occurred at visitor centers, trailheads, greening conferences, and numerous educational institutions.

The growing and harvesting of rapeseed, the oil extraction process, and fuel demonstration are all accomplished within a tri-state region around Yellowstone. The park will continue to commit to spearhead projects and partnerships that show regional success.

In September 1998, the truck's engine was completely torn down and analyzed, revealing very little wear and no carbon build-up. The truck is now [2000] in Phase II, in which the intent is to accumulate 200,000 miles over the next three years.

APPENDIX B. BAAQMD LIST OF BAY AREA'S MOST IMPOVERISHED NEIGHBORHOODS

Diesel vehicle projects that reduce emissions in areas listed below may receive preference for grant funds administered by BAAQMD. This list was obtained from the BAAQMD TFCA 2002 grant application materials.

BAAQMD List Of Bay Area's Most Impoverished Areas

Neighborhood	Impoverished Census Tracts*
Alameda County	
West Oakland	4007, 4009, 4010, 4013, 4014, 4015, 4016, 4017, 4018, 4019, 4021, 4022, 4024, 4025, 4026, 4027, 4028, 4029, 4030, 4031, 4034
San Antonio	4060
Fruitvale/San Antonio	4062
East Oakland	4075, 4088, 4090
Elmhurst District	4084, 4089, 4094
West Berkeley	4232,4233,4234, 4240
Contra Costa County	
Mid Pittsburg	3100
Bay Point	3141.01
Monument Area	3240, 3361, 3362, 3280
North Richmond	3650.02
Iron Triangle	3750, 3760, 3770
Coronado	3790, 3800
Marin County	
Portion of Novato	1050
Central	1110
Canal Area	1122
Portion of Marin City	1290
Napa County	
Portion of Napa City	2001, 2002, 2003, 2005, 2008
Portion of Yountville	2013
Portion of St. Helena	2016
Portion of Calistoga	2020
Sonoma County	
Portion of Boyes Hot Springs	1503.02
Roseland	1514, 1519, 1520, 1530.02, 1531, 1532, 1533
Apple Valley Way	1521, 1522
Northwest Santa Rosa	1529.02
Portion of Guerneville	1537.01

*Census tracts are 1990 Census tracts.

BAAQMD List Of Bay Area's Most Impoverished Areas (continued)

Neighborhood	Impoverished Census Tracts*
San Mateo County	
Portion of the City of Menlo Park	5116.02
Bayshore	6002
West Daly City	6004, 6005, 6006, 6007
East San Mateo	6061
North Fair Oaks Area	6102, 6102.02, 6105, 6106
Portion of East Palo Alto	6117, 6118, 6119, 6120, 6121.98
Santa Clara County	
Central San Jose	5008, 5009, 5010, 5013, 5014, 5015, 5016
East San Jose	5031.07, 5032.02, 5034, 5035.05, 5036.02, 5037.02 5037.03, 5037.04
Portion of Gilroy	5126.01
Solano County	
Portion of Vallejo	2506.01, 2507.01, 2507.02, 2509, 2510, 2511, 2512, 2515, 2516, 2518.02, 2519.03
Portion of Fairfield/Suisun City	2524.01, 2524.02, 2525.01, 2526.04, 2526.06, 2526.07, 2526.08, 2527.02
San Francisco	
Chinatown	107, 113, 114, 118
Tenderloin	124, 125
Fillmore/Hayes Valley Area	161
South of Market	176.98, 177, 180, 201.98
Outer Mission District	208
Mission District	229
Bayview/ Hunters Point	231, 609
Visitation Valley	605

*Census tracts are 1990 Census tracts.